153649

ACTION MEMORANDUM

DATE:

SUBJECT: Documentation of Verbal Authorization for a Removal Action at the Pyridium Mercury Disposal Site No. 2, Village of Harriman, Orange County, New York

FROM: James D. Harkay, On-Scene Coordinator
Removal Action Branch

TO: Kathleen C. Callahan, Director
Emergency and Remedial Response Division

THRU: Richard C. Salkie, Associate Director
Removal and Emergency Preparedness Programs

Site ID: EZ

I. PURPOSE

The purpose of this Action Memorandum is to document the verbal authorization received to conduct a removal action at the Pyridium Mercury Disposal Site No. 2 (Site). The Site is located at 40 South Main Street, Village of Harriman, Orange County, New York, 10926. The Site is a residential property which has been back-filled with mercury-contaminated industrial waste. A two-story house, located on the property, is rented and occupied by a woman and her two children. This document details the rationale used to conduct the removal activities implemented at the Site and discusses how the Site met the criteria for a removal action under Section 300.415(b)(2) of the National Contingency Plan (NCP).

On February 16, 1995, the U.S. Environmental Protection Agency (EPA) Director of Emergency and Remedial Response Division (ERRD) granted verbal authorization to conduct a removal action at the Site to secure and limit access to the mercury contaminated waste disposal area in front of the affected residential house. The funding approval to secure the Site was $50,000, of which $30,000 was for mitigation contracting.

The Site is not on the National Priorities List (NPL) and there were no nationally significant precedent-setting issues associated with the removal action.

ERRD: NAME:Pyridium #2: INIT:sb: DATE:08/23/95 CONCURRENCES DISK:A.M.#10: FILENAME:0092

SYMBOL: ==>	ERRD-RAB	ERRD-RAB	ERRD-RAB	ERRD-AOREPP	ORC-NYCSUP	ERRD-D		
SURNAME:==>	[illegible]	Rotola	Zachos	Salkie	[illegible]	Callahan		
DATE: ==>	8/23/95	8/25/95	8/25/95	8/25/95	9/8/95	9/27		

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II. SITE CONDITIONS AND BACKGROUND

The Comprehensive Environmental Response, Compensation, and Liability Information System ID number for this time-critical removal action is NY0001062850.

A. Site Description

1. Removal site evaluation

On October 21, 1994, a representative of the New York State Department of Health (NYSDOH) and the Village of Harriman Code Enforcement Officer (CEO) conducted an investigation of the Site. A whitish-grey solid, similar to the waste found at the Pyridium Mercury Disposal Site No. 1 (Pyridium 1), was discovered at the surface where a tree root broke through the soil. The waste was also observed in a residential front yard a few inches below the surface in small holes dug by the resident's pet dog.

On October 26, 1994, at the request of NYSDOH, the EPA and the Technical Assistance Team (TAT) collected three surface soil samples and two waste samples to determine if the Site was contaminated with mercury. Mercury was detected at concentrations ranging from 0.14 mg/kg to 27.5 mg/kg in the surface soils. Mercury was detected at concentrations ranging from 227 mg/kg to 456 mg/kg in the waste samples, collected from depths of 1 to 6 inches below the surface.

On October 29, 1994, nine additional surface soil samples (0 to 3 inches below any vegetative cover) were collected from a fenced portion of the yard which was used as a play area by the children and the pet dog living at the house located on the Site. Mercury was detected in the surface soils at concentrations ranging from 0.16 mg/kg to 117 mg/kg with an average of 35.1 mg/kg.

On November 17, 1994, the EPA Environmental Response Team (ERT) and the Response Engineering and Analytical Contractor (REAC) collected dust samples inside the house at the Site. Mercury was detected at concentrations of 1.38 mg/kg and 2.06 mg/kg in two dust samples collected from inside the house.

On November 30, 1994 the Site was formally referred to the EPA for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) removal action consideration via a letter from NYSDOH (Appendix A) and verbally confirmed by the New York State Department of Environmental Conservation.

On December 7, 1994, ERT, REAC, and TAT collected eleven soil borings on the Site to determine the extent of contamination. Soil samples collected from the borings were screened for mercury using a Spectrace Model 9000 X-Ray Fluorescence Analyzer.

Based on this and previous sampling it is estimated that approximately 500 cubic yards of waste and contaminated soil are present at the Site.

Site residents have been informed of the results of EPA's sampling and have been advised to limit their usage of contaminated areas on the property. A NYSDOH physician has discussed site-specific health concerns with the residents.

2. Physical location

Pyridium 2 is located in a mixed residential/commercial area on South Main Street, near the intersection of Route 17M and South Main Street (Appendix B, Figure 1). The Site is bordered on the northwest by a vacant lot, on the northeast by South Main Street, on the southeast by Ramapo Lane, and on the southwest by a gasoline service station. Two major thoroughfares, New York Routes 17 and 17M, are located less than a half mile from the Site. A grade school and playground are located within a half mile of the Site.

3. Site characteristics

The property encompasses 0.25 acres. The Site includes a nineteenth century farmhouse which predates the waste disposal activities. The two-story farmhouse has a stonewall basement with a concrete floor. The property is owned by Mr. Greg Epsaro of 4 Averill Avenue, P.O. Box 104, Harriman, New York. For the past three years, a woman and her two small children, ages six and seven, have rented and occupied the house.

In the early 1950's, approximately eight to 15 truckloads of waste were allegedly dumped in a "L" shaped configuration across the front yard. The waste was allegedly a mercuric or mercurous salt generated during the production of pyridium by the former Pyridium Corporation. The waste was used to backfill low-laying areas of the front yard.

This is the first removal action undertaken by the EPA at the Site.

4. Release or threatened release into the environment of a hazardous substance, or pollutant, or contaminant

Site investigations indicate that approximately 500 cubic yards of waste are present at the Site. Analytical results of the waste samples indicate elevated concentrations of mercury (max. 456 mg/kg). Mercury is a designated CERCLA hazardous substance as defined by Section 101(14) and is listed in 40 CFR Table 302.4. Mercury is typically found in soils in this geographic location at levels of less than 1 mg/kg.

Sampling conducted by EPA identified elevated concentrations of mercury at and below the ground surface. Mercury contaminated waste and soil present at the surface could migrate off-site by anthropogenic redistribution and surface water runoff and contaminate a larger area.

5. NPL status

The Site is not listed on the NPL. A Preliminary Assessment (PA) may be conducted to determine the need for a Site Inspection (SI) for possible NPL listing. The Site was evaluated by the Agency for Toxic Substances and Disease Registry (ATSDR). The January 1995 draft health consultation is included in Appendix C.

6. Maps, pictures and other graphic representations

Figures 1 and 2 in Appendix B provide the location and configuration of the Site.

B. Other Actions to Date

1. Previous actions

On November 28, 1994, EPA, ATSDR and NYSDOH held a public availability session to address community concerns regarding the potential health effects associated with Pyridium 1 and 2. The analytical results of the soil sampling events were made available to the public during the meeting.

Results of the EPA samples were submitted to ATSDR and NYSDOH for a health consultation. In January 1995, a Draft Health Consultation Report was prepared by the NYSDOH under a cooperative agreement with the ATSDR (Appendix C). The report states that the Pyridium Mercury Disposal Site No. 2 is a public health hazard due to the elevated concentrations of mercury in soils. On-site residents are suspected to be at risk of kidney damage through mercury ingestion, inhalation and dermal contact.

2. Current actions

The purpose of the current action was to secure the Site and minimize the potential for direct contact with mercury contaminated soil and waste. On February 27, 1995, EPA, Emergency Response Cleanup Services (ERCS) contractor and TAT mobilized to the Site to secure and limit access to the waste disposal area.

In order to secure the area, the existing fence was modified to enclose the area of contamination present in the front portion of the property. Additionally, to minimize the potential for continued exposure, a chain-link-fence enclosure was installed in an uncontaminated portion of the rear property to provide a

clean, secure play area for the children and family pet that reside on the Site.

Although mercury concentrations identified in dust samples collected from living areas in the residence were not at levels of public health concern, carpets and vinyl flooring were vacuumed and/or washed as a precautionary measure to remove any residual mercury which may have been tracked into the house by the children's or pet's outdoor activities.

The mitigation contracting cost to complete this removal action was approximately $12,000.

C. State and Local Authorities' Role

1. State and local actions to date

In October 1994, the NYSDOH and the Village of Harriman CEO conducted an investigation and discovered the waste at the Site. NYSDOH prepared the Health Consultation in conjunction with ATSDR and participated in public meetings and public availability sessions. A NYSDOH physician consulted with site residents regarding site-specific health concerns.

2. Potential for continued State/local response

State and local government agencies were unable to undertake timely and costly response actions to eliminate the threats posed by the Site. However, the NYSDOH offered health education services to the affected residents. The NYSDOH will investigate similar sites in the community as they are identified.

III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES

The Site met the criteria for a Removal Action under CERCLA as described in Section 300.415(b)(2) of the NCP. The Site poses a health threat to on-site and local residents and animals that could come in direct contact with the hazardous substances at the Site.

A. Threats to Public Health or Welfare

Elevated concentrations of mercury, a designated CERCLA hazardous substance, have been documented in surface and subsurface soils. On-site and local residents may have been exposed to mercury through the ingestion of mercury contaminated soil, the consumption of plants grown in contaminated soils, dermal contact with the waste or inhalation of mercury contaminated dust. Toxicological data regarding mercury exposure documents the risk of potential kidney and neurological system damage.

B. Threats to the Environment

High concentrations of hazardous substances located at or near the ground surface have migrated and have contaminated a larger area through surface water runoff and anthropogenic redistribution.

Local animal populations may have come into direct contact with hazardous substances located at or near the surface.

IV. ENDANGERMENT DETERMINATION

Actual or threatened release of a hazardous substance from this Site, if not addressed by implementing the response action selected in this Action Memorandum, would have presented an imminent and substantial endangerment to public health, or welfare, or the environment.

V. PROPOSED ACTIONS AND ESTIMATED COSTS

A. Proposed Actions

1. Proposed action description

The purpose of this Action Memorandum is to document actions taken by EPA at the Site under the February 16, 1995 verbal authorization of the Director of the ERRD. The removal action minimized the potential for direct contact with the mercury contaminated soil and waste. A chain-link fence was erected to prevent the children from playing in the contaminated area and to provide a clean, secure area for the children and family pet to play. Additionally, the pre-existing fence on the front property was modified to totally enclose the area of contamination. The activities performed under this Action Memorandum cost an estimated $12,000 for mitigation contracting and were completed on March 9, 1995.

Additional actions are necessary at the Site which may include the excavation and disposal of contaminated soil and the restoration of the Site to pre-excavation conditions. These actions will be undertaken under a separate removal action.

2. Contribution to remedial performance

The actions presented in this document were consistent with any long term cleanup at the Site and were interim measures necessary to mitigate the immediate threats associated with the hazardous substance on the property.

3. Description of alternative technologies

No other alternative technologies were considered for securing the Site, since the option chosen was environmentally safe and

cost effective to mitigate the immediate threat to on-site and local residents.

4. Engineering Evaluation/Cost Analysis (EE/CA)

Due to the time-critical nature of this removal action, an EE/CA was not prepared.

5. Applicable or relevant and appropriate requirements (ARARs)

ARARs that were within the scope of this removal action were met to the extent practicable. The federal ARARs determined to be applicable for this removal action was the Occupational Safety and Health Act.

6. Project schedule

The removal actions in this Action Memorandum were initiated on February 27, 1995 under verbal authorization from the Director of the ERRD and completed on March 9, 1995.

B. Estimated Costs

A summary of the estimated costs for the completed removal action is presented below.

Extramural Costs:	
Total Cleanup Contractor Costs (ERCS)	$12,000
Other Extramural Costs Not Funded from the Regional Allowance:	
Total TAT	$ 4,000
TOTAL, EXTRAMURAL COSTS	**$16,000**
Intramural Costs:	
TOTAL, INTRAMURAL COSTS	**$ 2,000**
TOTAL, REMOVAL PROJECT CEILING	**$18,000**

VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

The actions outlined in this Action Memorandum were an interim measure to secure the Site and mitigate the immediate threat to on-site and local residents. If no action was taken or the planned action delayed, the on-site residents would continue to be exposed to hazardous substances present at the Site.

VII. OUTSTANDING POLICY ISSUE

No known outstanding policy issues were associated with the Site.

VIII. ENFORCEMENT

Site-related enforcement activities were initially limited due to time constraints resulting from the time-critical determination for the removal action.

In October 1994, EPA TAT conducted a title and deed search of the property. Property owner information was obtained from 1894 to the present and is being kept on file.

The on-site waste was reportedly generated during the 1940's and 1950's by the Pyridium Corporation. Nepera, Inc., currently owns and operates the facility previously operated by Pyridium Corporation.

IX. RECOMMENDATION

This decision document represents the selected removal action for the Pyridium Mercury Disposal Site No. 2 in the Village of Harriman, Orange County, New York, developed in accordance with CERCLA, as amended, and not inconsistent with the NCP. This decision was based on the administrative record for the Site.

Conditions at the Site met the NCP Section 300.415(b)(2) criteria for the completed removal action. The total estimated project ceiling cost for this phase of the removal action is $18,000, of which $12,000 came from the Regional removal allowance.

Please confirm the February 16, 1995 verbal authorization of funding for this Site, as per current Delegation of Authority, by signing below.

APPROVAL: _____ DATE: _____
Kathleen C. Callahan, Director
Emergency and Remedial Response Division

DISAPPROVAL: _____ DATE: _____
Kathleen C. Callahan, Director
Emergency and Remedial Response Division

cc: (after approval is obtained)

J. Fox, RA	R. Gherardi, OPM-FIN
R. Salkie, ERRD-ADREPP	S. Murphy, OPM-FAM
W. McCabe, ERRD-DDNYC/P	D. Dietrich, 5202G
G. Zachos, ERRD-RAB	T. Eby, 5202G
J. Rotola, ERRD-RAB	C. Moyik, ERRD-PS
M. Randol, EPD	M. O'Toole, NYSDEC
E. Schaaf, ORC-NYCSUP	T. Vickerson, NYSDEC
V. Capon, ORC-NYCSUP	C. Kelly, TATL

APPENDIX A

STATE OF NEW YORK
DEPARTMENT OF HEALTH

Center for Environmental Health 2 University Place Albany, New York 12203-3399

Mark R. Chassin, M.D., M.P.P., F.A.C.P.
Commissioner
Paula Wilson
Executive Deputy Commissioner

OFFICE OF PUBLIC HEALTH
Lloyd F. Novick, M.D., M.P.H.
Director
Diana Jones Ritter
Executive Deputy Director
William N. Stasiuk, P.E., Ph.D.
Center Director

November 30, 1994

Ms. Kathleen C. Callahan, Director
Emergency & Remedial Response Division
United States Environmental
Protection Agency
Region II
26 Federal Plaza
New York, New York 10278

RE: Mitigating Potential Exposures
Pyridium Mercury Site #[redacted]
NYSDOH Site #336822N
(V)Harriman, Orange County

Dear Ms Callahan:

On October 21, 1994, my staff investigated a report of a possible second Pyridium Mercury Disposal site at 40 South Main Street in the Village of Harriman, Orange County. A mother and her two children, ages 6 and 7, are the only current residents. Allegedly, eight to fifteen truckloads of the Pyridium wastes were used as fill in the front yard of a single family residence during the early 1950's. Shoveled test holes were dug with the assistance of the property owner and the Village of Harriman Code Enforcement Officer. A Nepera, Inc. official was present during this preliminary inspection. Whitish gray Pyridium-like wastes were discovered a few inches below the ground surface at several locations in the front yard of this late 1800's home. Surface wastes were observed only where a large willow tree root broke through the grass cover. This spot was immediately covered over by investigators to minimize casual contact.

At our request, the United States Environmental Protection Agency (EPA) collected one surface soil, two subsurface soil, and two subsurface waste samples on October 26, 1994. The results of the testing demonstrated that there are significantly elevated levels of mercury in tho subsurface wastes (two samples: 227 and 456 parts per million (ppm) of total mercury). The surface soil sample collected within the fenced yard, where the two children and family dog spend much of their play time, contained 27.5 ppm of total mercury. Because mercury is typically found in soils at levels less than 1 ppm, we and a representative of the federal Agency for Toxic Substances and Disease Registry recommended confirmatory surface soil sampling within the play yard. On October 29, 1994 the EPA collected nine additional surface soil (0 to 3 inches below any vegetative cover) samples to further assess the extent of surface contamination so that appropriate public health decisions could be made. Total mercury levels ranged from 0.1 to 117 ppm with an average of 35.1 ppm. Mercury contamination appears to increase markedly from the front porch outward

toward the reported area of historic waste disposal. Based on field observations, less obvious mercury contamination detected in surface soils within the fenced play area may be the direct result of the family's pet repeatedly digging in the yard.

Exposure to either inorganic or organic mercury can permanently damage the brain, kidneys, and developing fetus. The most sensitive target of low-level exposure to inorganic mercury appears to be the kidneys. Exposure to mercury in the soil can occur through a number of routes. There is the potential for direct oral exposure via ingestion of soil, dust, and garden produce grown in contaminates soil. Mercury can be absorbed into the body via dermal contact through activities associated with soil disturbances such as gardening, yard work, and play. The potential for inhalation of mercury particulates and mercury vapor is also a concern.

The elevated levels of mercury in soil are a public health concern. To minimize potential human exposure to these chemical wastes, the tenant and the property owner have been advised to avoid physical contact with front yard soils and to avoid disturbing any soils whatsoever. Based on the results of the EPA's follow-up sampling, the mother has been advised to keep her children and dog out of the fenced play area. Vegetable gardening is not recommended. These temporary advisories should be followed by a permanent solution as the presence of these wastes on a residential property pose a current and future threat to public health.

With this information, I am seeking the EPA's assistance in reducing or eliminating the conditions causing this potential human health hazard in the Village of Harriman. I am further asking that the EPA either enter into an Order on Consent with Nepera, Inc. or else respond to this situation using federal Superfund monies to assure that the presence of this hazardous substance within a residential neighborhood is satisfactorily addressed to eliminate the exposure potential. it is important to note that as a result of public meetings and media attention associated with the first Pyridium Mercury Disposal (trailer park) site which is just up the road, the community has a heightened desire for a thorough investigation and clean-up of this property as well as any others that may be discovered with similar wastes in the future.

We look forward to working with the EPA toward a satisfactory resolution of this sensitive public health issue. Should you wish to discuss the matter further, do not hesitate to contact me at (518) 458-6310.

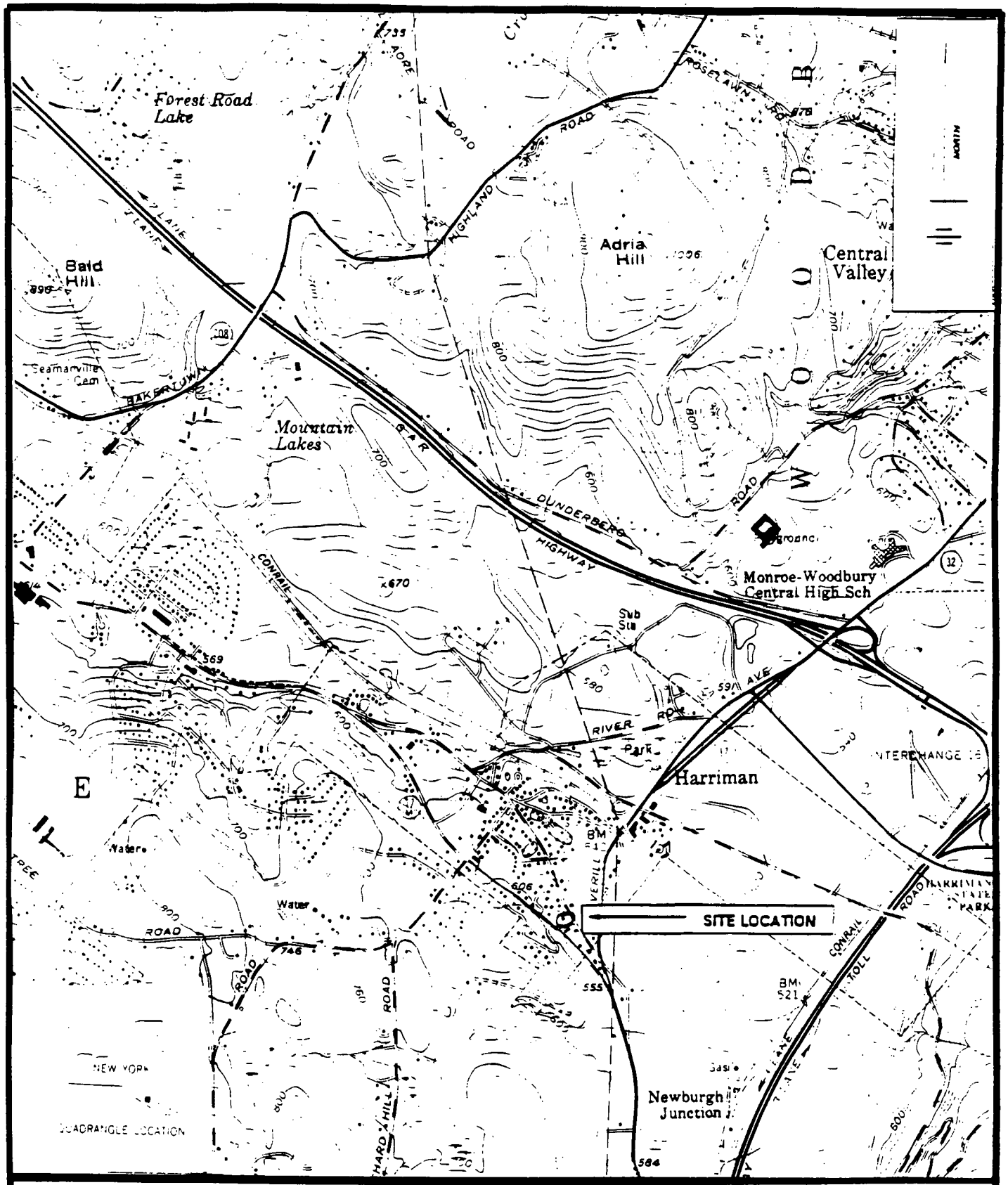
Sincerely,

G. Anders Carlson, Ph.D.
Director
Bureau of Environmental Exposure
Investigation

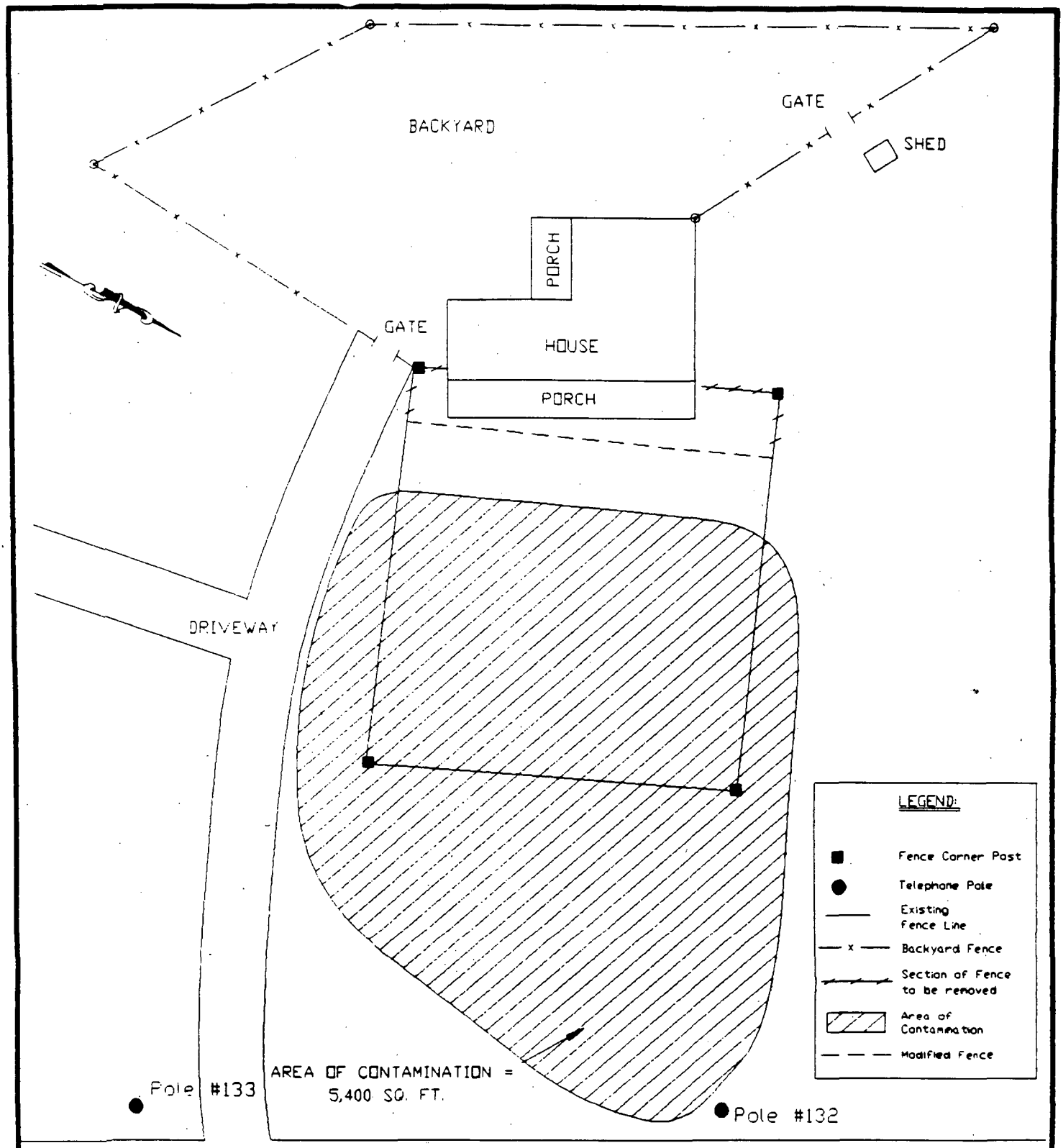
sms/94300PRO0671

cc: Dr. N. Kim
Mr. S. Bates/Mr. M. Valkenburg
Mr. J. Crua
Mr. M. Knudsen
Ms. N. Knapp
Mr. S. Abrams
Mr. M. Schleifer - OCHD
Mr. M. O'Toole - DEC
Mr. S. Ervolina/ Ms. S. McCormick - DEC
Mr. A. Klauss - DEC Region 3
Mr. G. Zachos/Mr. J. Rotola - EPA Region II
Mr. A. Block/Mr. S. Jones - ATSDR
Mr. D. Humphrey - Mayor of Harriman

APPENDIX B



WESTON MANAGERS DESIGNERS CONSULTANTS Roy F. Weston, Inc. MAJOR PROGRAMS DIVISION	EPA PM D. HARKAY	FICURE 1 SITE LOCATION MAP
IN ASSOCIATION WITH FOSTER WHEELER CORP., C.C JOHNSON & MALHOTRA, P.C., RESOURCE APPLICATIONS, INC. AND R.E. SARRIERA ASSOCIATES	TAT PM S. MAY	FYRIDIUM MERCURY DISPOSAL SITE NO. 2



S. MAIN ST.

FIGURE 2 - SITE MAP

PYRIDIUM MERCURY DISPOSAL SITE NO. 2

HARRIMAN, NEW YORK

DRAWING NOT SCALE.

APPENDIX C

RLL 1/31/95

REVIEW DRAFT

HEALTH CONSULTATION

PYRIDIUM MERCURY DISPOSAL SITE #2
HARRIMAN, ORANGE COUNTY, NEW YORK
CERCLIS NO.

JANUARY 1995

Prepared by:

New York State Department of Health
Under a Cooperative Agreement with the
Agency for Toxic Substances and Disease Registry

BACKGROUND AND STATEMENT OF ISSUE

The New York State Departments of Health (NYS DOH) through a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR) has reviewed information and analytical data from the Pyridium Mercury Disposal Site #2 to determine if there is a public health threat associated with exposure to mercury. The Pyridium Mercury Disposal Site #2 (Figure 1) is located on a residential lot along South Main Street in the Village of Harriman, Town of Monroe, Orange County, near the intersection of Routes 17M (Ramapo Avenue) and South Main Street. Site #2 is within one-quarter mile of Pyridium Site #1, the trailer park (Figure 2). The area of concern (Figure 3), which is about one-quarter acre in size, includes an old farmhouse built in the late 1800's that pre-dates the waste disposal activities. The rental property is bounded to the northwest by an overgrown lot, to the southwest by a gasoline service station, to the southeast by Ramapo Lane and to the northeast by South Main Street. The two-story house has been occupied for approximately 3 years by a Caucasian mother and her two children, ages six (son) and seven (daughter). Access to the basement, used only for storage, is from the outside. The stone-walled basement has a concrete floor and is primarily dry throughout the year. According to an eyewitness, eight to fifteen truckloads of waste materials, a mercuric or mercurous salt

generated during the production of niacinamide (vitamin B-3) by the former Pyridium Corporation, were allegedly dumped during the early 1950's in an "L" shape down and across the front yard.

On October 21, 1994, the NYS DOH assisted the Village of Harriman Code Enforcement Officer in investigating a report of a possible second disposal site. Shoveled test holes were dug with the assistance of the property owner and the Code Enforcement Officer. A Nepera, Inc., official was present during this preliminary investigation. Whitish-gray, Pyridium-like wastes were discovered a few inches below the ground surface at several locations in the front yard. Surface wastes were observed only where a large willow tree root broke through the grass cover.

At the request of the NYS DOH, the United States Environmental Protection Agency (USEPA) collected one surface soil sample (0-1 inch below ground surface), two subsurface soil samples (0-3 inches below ground surface) and two subsurface waste samples (3-6 inches and 1-6 inches below ground surface) on October 26, 1994. The results of the testing demonstrated that there are significantly elevated levels of mercury in the two subsurface waste samples (227 and 456 milligrams of total mercury per kilogram of soil [mg/kg]). The surface soil sample collected within the fenced yard, where the two children and family dog spend much of their play time,

contained 27.5 mg/kg of total mercury. Because mercury is typically found in soils at levels less than 1 mg/kg, confirmatory surface soil sampling within the play yard was recommended.

On October 29, 1994, the US EPA collected nine additional surface soil (0 to 3 inches below any vegetative cover) samples to further assess the extent of surface contamination so that appropriate public health decisions could be made. Total mercury levels ranged from 0.1 to 117 mg/kg with an average of 35.1 mg/kg. Mercury contamination appears to increase markedly from the front porch outward toward the reported area of waste disposal. Based on field observations, less obvious mercury contamination detected in surface soils within the fenced play area may be the direct result of the family's pet repeatedly digging in the yard.

Based on the results of laboratory testing (speciation) of a waste sample collected from the original Pyridium Mercury Disposal site #1 (trailer park) and the similar appearance of these wastes, it is presumed that the mercury found in the soils at site #2 is inorganic in nature.

Residents rely on the Village of Harriman municipal water supply for drinking water. These wells are not located near the site. The village water is regularly monitored to ensure that it meets

State drinking water standards for public supplies. The service connection from the watermain to the house does not pass through buried waste materials. Entry of contaminants into the buried water pipes is unlikely. Should there be a crack, break, breach, or compromise in the integrity of the waterline piping, positive pressure within the pipes would force water out rather than allow contaminants to seep in. A major break in a waterline would be readily noticed by residents through a loss of water at the tap and by discolored (i.e., dirty) water.

DISCUSSION

Mercury is present at higher than normal background levels in surface soil and surface wastes at the Pyridium Mercury Disposal site #2. Exposure to mercury in surface soil and surface waste may occur via accidental ingestion (eating) of soil and dust, eating of garden fruits and vegetables grown in contaminated soils, skin contact or breathing of mercury contaminated dust or vapor. Children generally eat greater amounts of soil and dust than adults. This is especially true for preschoolers because they tend to put their hands or fingers in their mouths or for children with pica (an unreasonable craving), in this case, for soil. Those children who repeatedly handle the waste material extensively would

have a high likelihood of ingesting the mercury waste which could stick to their hands. Mercury contaminated soil can also be tracked into the home on shoes and left on floors and surfaces where people could come in contact with it. A family pet, such as a dog or cat, can walk through, dig into, lie upon, or roll over contaminated soils and carry mercury contamination into the home on its paws and/or fur. Indirect exposure for an infant can occur from eating contaminated breast milk if the mother were exposed to mercury.

Long-term exposure to mercury can damage the kidneys, nervous system, and developing fetus (baby). The most sensitive target organ for low-level inorganic mercury exposure appears to be the kidneys.

Health risk comparison values are used to assess if further evaluation of the soil is needed. Several factors are considered in the evaluation including soil ingestion rate, the size and age of the exposed individual, length of exposure and the health effects data. A health comparison value for mercury in soil is the mercury concentration in soil which would provide, by ingestion, a dose of mercury equal to the daily exposure below which adverse health effects are unlikely to occur. A contaminant at concentrations exceeding a health comparison value does not mean

that either exposure to the contaminant or adverse health effects have occurred or will occur.

Health comparison values are developed assuming worst case exposure, i.e., the greatest likely exposure. Using soil ingestion rates for children with pica will overestimate soil ingestion rates for the general public.

Soil mercury concentrations identified at the site range from 0.1 to 456 mg/kg. Table 1 (Appendix B) contains soil health comparison values for inorganic mercury. The soil mercury concentrations at the site exceed some of the health comparison values. Therefore, the soil concentrations of mercury at the Pyridium Mercury Waste Disposal Site #2 warrant further characterization and evaluation of exposure pathways and the potential for adverse health effects in individuals who may have been exposed to the waste materials.

A child with pica has the highest exposure and, based on the highest soil mercury concentration (456 ppm), is at high risk of having adverse kidney effects. Children without pica and adults are at minimal risk of having adverse kidney effects. Fruits and vegetables grown in contaminated soil are an additional potential source of exposure. Mereury levels are higher in plants grown in contaminated soil than in those grown in soil which is not

contaminated. Eating such plants could contribute additional mercury to the diet.

Urine mercury screening of the residents living on-site has been carefully considered. Based on the results of the urine mercury screening of fourteen residents of the Pyridium Mercury Disposal Site #1, testing of site #2 residents does not appear necessary since the urine mercury levels of site #1 residents (those most likely at risk of exposure due to the accessibility of the waste material) were within the normal range, less than 20 micrograms per liter. Site #1 residents' urine mercury screening results indicate exposure has not caused an increase in mercury levels in the body to levels of concern for adverse health effects.

The soil mercury concentrations at the site provide a source for exposure which could produce health effects in individuals whose activities lead to greater contact with the waste material.

CONCLUSIONS

Based on the information reviewed, the NYS DOH in consultation with ATSDR concludes the following:

1. The Pyridium Mercury Disposal Site is a public health hazard

because inorganic mercury occurs in soil at concentrations which may cause health effects. Residents, particularly preschool children who may eat contaminated soil and residents eating plants grown in the contaminated soil, are at risk of kidney damage due to the mercury contamination at the Pyridium Mercury Disposal Site #2.

2. At a minimum, exposure to inorganic mercury may have occurred via dermal contact based on discussions with the tenant and on field observations.

3. The nature and extent of contamination at this site has not been completely characterized. Contamination other than inorganic mercury may be present within subsurface fill materials.

4. Based on the results of the urine mercury screening of fourteen residents of the Pyridium Mercury Disposal Site #1, testing of Site #2 residents does not appear necessary at this time. The NYS DOH does not plan, at this time, to track previous site residents to conduct urine mercury analysis since the urine mercury levels of Site #1 residents (those most likely at risk of exposure due to the accessibility of the waste material) were within the normal range, less than 20

micrograms per liter. In addition, it is unlikely that mercury would be detected above the normal range in persons exposed several months before the urinary mercury testing because mercury leaves the body over time.

RECOMMENDATIONS

1. Measures should be taken to prevent exposures to front yard soils which contain the mercury wastes. Temporary measures are needed to allow for the residents' daily activities.

2. To evaluate exposure to mercury in the home, dust samples should be collected within the house.

3. The nature and extent of contamination at the site should be completely characterized. A comprehensive analysis of the wastes should be performed. Sampling of soils, wastes, and groundwater should extend outward and downward to determine areas requiring future remedial actions. Subsurface investigations might potentially identify other types of chemical wastes used as fill, or find buried drums, or detect groundwater contamination.

4. The company or agency that performs the additional environmental sampling should work with the NYS DOH so that sample design and detection levels are appropriate to base further public health decisions upon.

5. Impose deed restrictions on the property, in the absence of total waste removal, to prevent possible disturbance and contact with buried wastes.

6. During future site clean-up involving excavation, site residents should be temporarily relocated to minimize potential exposures or personal injuries.

HEALTH ACTIVITIES RECOMMENDATION PANEL (HARP) RECOMMENDATIONS

This health consultation for the Pyridium Mercury Disposal Site #2 will be reviewed by ATSDR's Health Activities Recommendation Panel (HARP) to determine appropriate follow-up public health actions.

PUBLIC HEALTH ACTIONS

Public Health Actions Taken

1. The NYS DOH held a public availability session on November 28,

1994, to provide information to the community about the site and address health-related concerns.

2. A NYS DOH physician talked with the adult resident (mother) about health concerns related to the site.

Public Health Actions Planned

1. ~~It is anticipated that~~ waste removal ~~will~~ may occur sometime in ~~Spring or~~ Summer of 1995. The three residents and dog ~~will~~ may be temporarily relocated by the US EPA ~~for the duration of removal activities~~. Should excavation of contaminated soil occur.

2. The NYS DOH will review all site-related investigation reports and health-related information and, if necessary, hold additional public meetings to keep the community informed of activities at the site.

3. The NYS DOH will continue to investigate reports of the existence of other similar sites in the community.

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Table 1. SOIL COMPARISON VALUES FOR RESIDENTIAL EXPOSORS TO INORGANIC MERCURY

COMPARISON VALUE	Ingestion of Soil			Soil and Homegrown Produce***	
Duration of Exposure:	Child[2]	Pica Child[1]	Adult[3]	Child[2]	Adult[3]
Short-term*	14 ppm	--	9800 ppm		
Long-term**	0.6 ppm	47 ppm	420 ppm	1.5 ppm	4.9 ppm

[1]Assumes child with pica weighs 10 kg and ingests 5000 milligrams (mg) of soil per day.

[2]Assumes a 13.2 kg child, and a time-weighted-average soil ingestion of a5.2 mg soil per day to account for weekly and seasonal variability when estimating chronic exposures.

[2]Assumes an adult weighs 70 kg and ingests 50 mg of soil per day.

*ATSDR has established short-term level for inorganic mercury of 0.007 milligram per kilogram per day (mg/kg/day). It is a level of short-term exposure to inorganic mercury below which adverse health effects are unlikely to occur.

**US EPA has established a long-term level for inorganic mercury of 0.0003 mg/kg/day. It is a level of long-term exposure to inorganic mercury below which adverse health effects are unlikely to occur.

***Assumes 40% consumption of homegrown fruits and vegetables.